

Issues in Equation of State Modeling for Flow Assurance Applications

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Simulation of flow assurance issues in the energy industry requires accurate modeling of fluid properties and phase behavior. Flow assurance is related to preventing plugging of fluid transmission systems because of deposits from scale, gas hydrates, asphaltenes, waxes, and emulsions. Modeling of the properties of crude oil systems requires tuning of an appropriate equation of state to the crude oil properties and phase behavior. Advantages and limitations of available equation of state models are presented. Issues related to tuning and use of equations of state are discussed. Examples related to the effects of gas injection and oil based mud contamination on asphaltene phase behavior, compositional grading, and high temperature and high pressure systems are used to illustrate concepts.